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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,243	12/21/2001	Yoshiro Shiokawa	111522	3419

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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 06/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024 243

Applicant(s)

SHIOKAWA ET AL.

Examiner

Phillip A Johnston

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 1-8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☒ All b) ☐ Some * c) ☐ None of
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application):
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other

Detailed Action

Claims Objection

1. Claim1 is objected to because of the following informalities: Claim 1 recites the limitation "selecting one third component gas." There is insufficient antecedent basis for this limitation in the claim. The reference to a "third component gas" in Claims 1-8 without reference to a first component gas and a second component gas, is objected to. In addition, "the gas" in lines 4 and 5 lack a proper antecedent basis since a "plurality of gases " is recited in the Claim.

Appropriate correction is required.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,566,652 to Kato, in view of Kato, U.S. Patent No. 6,008,490 and in further view of Sato, U.S. Patent No. 5,194,739.

Kato (652) discloses In order to provide an atmospheric pressure ionization mass spectrometry apparatus in which the internal chamber of an ion source is not contaminated by ambient air, by automatically providing gas such as nitrogen to the ion source, with a simple means and without demanding a special operation by an operator when the measurement is finished, a sample solution from a liquid chromatograph is nebulized as fine droplets, each having a charge, from a nebulizer probe, and sample ions included therein are expelled into an atmosphere in the atmospheric pressure ion source and transferred to a mass spectrometer in a high vacuum part through a aperture, an intermediate pressure chamber and aperture. The ions are mass-analyzed, are detected by a detector, and mass spectra are provided and processed by a data processing device. When the measurement is finished, the stop valve is closed by a controller and a data processor 19, and the gas is supplied from the gas cylinder 40 to the nebulizer probe 4 through a by-pass pipe arrangement 41. Thereby, the atmospheric pressure ion source 7 is prevented from reaching a negative pressure. See Abstract

Kato (652) also discloses that the ions which are generated (emitted), enter into the high vacuum part 16 evacuated by the vacuum pump 22 as an ion beam 17, from the aperture 11 for sampling the ions, through the intermediate pressure chamber 12 evacuated by the vacuum pump 23 and the aperture 14. The ions travel to the mass

spectrometer 15, are mass-analyzed there, and are detected by the detector 18 so as to provide a mass spectrum or a mass chromatogram using the data processor 19.

See Column 5, line 59-67.

Kato (652) also discloses that when a plural gas is supplied to the atmospheric pressure ion source 7, it is not necessary to provide the by-pass pipe arrangement for all gas supply lines. That is to say as shown in FIG. 2, for example, when there is another gas supply system, including the gas pipe arrangement (a passage) 43, to the nebulizer probe 4 through the stop valve 45 and the needle valve 46, besides the gas supply system including the gas pipe arrangement (a passage) 43 connected to the gas cylinder 40 to the nebulizer probe 4 through the stop valve 42 and the needle valve 44, if at least one gas supply system, for example, gas pipe arrangement 43 is provided with a by-pass pipe arrangement (a passage), the atmospheric pressure ion source 7 can be prevented from reaching a negative pressure. Many kinds of the gases are supplied besides the nebulization gas in the atmospheric pressure ion source 7. See Column 6, line 54-56; and Column 7, line 11-12.

It is implied herein that the apparatus and method for supplying plural gases to an ion chamber, in accordance with Kato (652) above, is equivalent to the use of "the third component gas", as recited in Claims 1-8.

Also, it is well known in the art to utilize metal ion emitters, as recited in Claims 5,6,7, and 8. See for example U.S. Patent No. 5,194,739.

Kato (652) as applied above does not disclose the step of performing the measurement a plurality of times in different third component gases and distinguishing

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an interference peak arising due to the third component gas from the data obtained from these measurements, as recited in Claims 2,4,6, and 8. However, Kato (490) discloses an apparatus for measuring and analyzing a mass spectrum, comprising means for creating an ion under the atmospheric pressure or thereabout, a mass spectrometer to which the created ion is introduced for mass spectrometry, and data processing means for processing and analyzing a mass spectrum output from the mass spectrometer, the data processing means comprising adduct ion storage means for storing plural mass differences between a quasi-molecular ion and a plurality of adduct ion types, and an analyzing portion for determining an index indicating how many times mass differences between the mass selected from the output mass spectrum and other masses agree with the plural mass differences stored in the adduct ion storage means, and estimating, based on index values determined for respective selected masses, the ion providing a maximum value of the index indicating agreement of the mass difference as a quasi-molecular ion.

Preferably, the analyzing portion stores adduct ions associated with the estimated quasi-molecular ion for each cycle of mass spectrometry, determines emergence frequency for each of the stored adduct ions after repeating the mass spectrometry in a predetermined number of times, allocates weights to the plurality of adduct ion types depending on respective determined emergence frequencies, stores the weights in the adduct ion storage means, and adds the stored weights to the index values in estimating a quasi-molecular ion.

Thus, the ion types having high emergence frequency are automatically

weighted and stored in the adduct ion storage means. Accordingly, the accuracy of mass spectrometry for the objects which are analyzed in many times by individual mass spectrum measuring/analyzing apparatus can be improved.

Preferably, the data processing means subtracts a background spectrum given as a mass spectrum in the region where a component to be analyzed does not appear from the mass spectrum output from the mass spectrometer, and the analyzing portion estimates a quasi-molecular ion based on a mass spectrum resulted from the subtraction.

Preferably, the adduct ion storage means stores plural mass differences between a quasi-molecular ion and a plurality of adduct ion types in a plurality of storage tables divided in accordance with the kind of solvent used in mass spectrometry, the ionization mode and the polarity of spectrum, and the analyzing portion selects suitable one of the storage tables depending on analyzing conditions of the mass spectrometry. Since a suitable storage table is selected depending on analyzing conditions of the mass spectrometry, a quasi-molecular ion can be estimated in an optimum way depending on the analyzing conditions. See Column 5, line 1-60.

Therefore it would have been obvious to one of ordinary skill in the art that the mass spectrometry apparatus and method of Kato (652) can be modified to use the spectrum measuring method and apparatus in accordance with Kato (490), to provide a method and apparatus for measuring and analyzing a mass spectrum by which a quasi-molecular ion and hence the molecular weight of a sample can be quickly

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estimated with high accuracy while preventing an error from being mixed in the process of analysis.

Regarding Claims 9 and 10, the use of ion emitters arranged at positions offset from the axis is well known in the art. See for example U.S. Patent No.6,326,616.

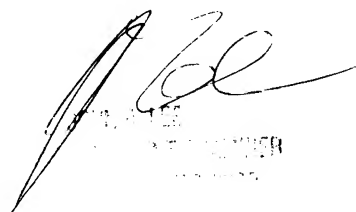
Conclusion

4. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (703) 305-7022. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (703) 308-4116. The fax phone numbers are (703) 872-9318 for regular response activity, and (703) 872-9319 for after-final responses. In addition the customer service fax number is (703) 872- 9317.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

May 30, 2003



PHILLIP JOHNSTON
EXAMINER